

# SEQUENCE LISTING

In the following SEQ ID Nos. 1, 3, 5 the 5', coding sequence and 3' sequence of the relevant  $\alpha$ -amylase genes are illustrated. The 5' sequence is the first separate part of the sequence written with lower case letters, the coding sequence is the intermediate part of the sequence, where the signal sequence is written with lower case letters and the sequence encoding the mature  $\alpha$ -amylase is written with upper case letters, and the 3' sequence is the third separate part of the sequence written with lower case letters.

## SEQ ID No. 1

cggaagattggaagtacaaaaataagcaaaagattgtcaatcatgtcatgagccatgcgg-gagacggaaaaatcgtctta  
atgcacgatatttatgcaacgttcgcagatgctgctgaa-gagattattaaaaagctgaaagcaaaaggctatcaattggt  
aactgtatctcagcttgaagaagtgaagaagcagagaggctattgaataaatgagtagaagcgccatatcggcgcttttc  
tttgaagaaaaatagggaaaaatggtacttgttaaaaatcggaatatttatacaacatcatatgtttcacattgaaagggaggagaatc

atgaaacaacaaaaacggctttacgcccgaattgctgacgctgttatttgcgctcatcttcttgcctgc  
ctcattctgcagcagcggcgGCAAATCTTAATGGGACGCTGATGCAGTATTTTGAATGGTAC  
A T G C C C A A T G A C G G C C A A  
CATTGGAGGCGTTTGCAAAACGACTCGGCATATTTGGCTGAACACGGTATTACT  
G C C G T C T G G A T T C C C C C G G C A T A T A A  
GGGAACGAGCCAAGCGGATGTGGGCTACGGTGCTTACGACCTTTATGATTTAGG  
G G A G T T T C A T C A A A A A G G G A C G G T T C  
GGACAAAGTACGGCACAAAAGGAGAGCTGCAATCTGCGATCAAAAGTCTTCATT  
C C C G C G A C A T T A A C G T T T A C G G G G A T  
GTGGTCATCAACCACAAAGGCGGCGCTGATGCGACCGAAGATGTAACCGCGGTT  
G A A G T C G A T C C C G C T G A C C G C A A C C G  
CGTAATTTTCAGGAGAACACCTAATTAAAGCCTGGACACATTTTCATTTCCGGG  
G C G C G G C A G C A C A T A C A G C G A T T T T A  
AATGGCATTGGTACCATTTTGACGGAACCGATTGGGACGAGTCCCGAAAGCTGA  
A C C G C A T C T A T A A G T T T C A A G G A A A G  
GCTTGGGATTGGGAAGTTTCCAATGAAAACGGCAACTATGATTATTTGATGTAT  
G C C G A C A T C G A T T A T G A C C A T C C T G A

TGTCGCAGCAGAAATTAAGAGATGGGGCACTTGGTATGCCAATGAACTGCAATT  
 G G A C G G T T T C C G T C T T G A T G C T G T C A  
 AACACATTAATTTTCTTTTTTTCGGGATTGGGTAAATCATGTCAGGGAAAAAA  
 C G G G G A A G G A A A T G T T T A C G G T A G C T  
 5 GAATATTGGCAGAATGACTTGGGCGCGCTGGAAAACTATTTGAACAAAACAAAT  
 T T T A A T C A T T C A G T G T T T G A C G T G C C  
 GCTTCATTATCAGTTCCATGCTGCATCGACACAGGGAGGCGGCTATGATATGAG  
 G A A A T T G C T G A A C G G T A C G G T C G T T T  
 CCAAGCATCCGTTGAAATCGGTTACATTTGTCGATAACCATGATACACAGCCGG  
 10 G G C A A T C G C T T G A G T C G A C T G T C C A A  
 ACATGGTTTAAGCCGCTTGCTTACGCTTTTATTCTCACAAGGGAATCTGGATACC  
 C T C A G G T T T T C T A C G G G G A T A T G T A  
 CGGGACGAAAGGAGACTCCCAGCGCGAAATTCCTGCCTTGAAACACAAAATTG  
 A A C C G A T C T T A A A A G C G A G A A A A C A G T  
 15 ATGCGTACGGAGCACAGCATGATTATTTTCGACCACCATGACATTGTCGGCTGGA  
 C A A G G G A A G G C G A C A G C T C G G T T G C A  
 AATTCAGGTTTGGCGGCATTAATAACAGACGGACCCGGTGGGGCAAAGCGAAT  
 G T A T G T C G G C C G G C A A A A C G C C G G T G A  
 GACATGGCATGACATTACCGGAAACCGTTGGGAGCCGGTTGTCATCAATTCGGA  
 20 A G G C T G G G G A G A G T T T C A C G T A A A C G  
 GCGGGTCGGTTTCAATTTATGTTCAAAGATAG  
 aagagcagagaggacgatttcctgaaggaaatccgttttttatttt

SEQ ID No. 2

25 ANLNGTLMQYFEWYMPNDGQHWRLQND SAYLAENGITAV  
 WIPPAYKGTSQADVGYGAYDLYDLGEFHQKGTVRTKYGTK  
 GELQSAIKSLHSRDIN VYGDVVINHKG GADATEDVTAVEV  
 DPADRNRVISGEHLIKAWTHFHPGRGSTYSDFKWHWYHF  
 DGTDWDES RKLNR IYKFQ GKAWDWEVSNENGN YDYL MYAD  
 30 IDYDHPDVAAEIKRWGTWYANELQLDGFRLDAVKHIKFSF  
 LRDWVNVHREKTGKEMFTVAEYWQNDLGALENYLNKTNFN  
 HSVFDVPLHYQFHAAS TQGGGYDMRKLLNGTVVSKHPLKS

VTFVDNHDTQPGQSLESTVQTFWKPLAYAFILTRESGYPO  
VFYGD MYG TKGDSQREIPALKHKIEPILKARKQYAYGAQH  
DYFDHHDIVGWTREGDSSVANSGLAALITDGP GGA KRMYV  
GRQNAGETWHDITGNRSEPVVINSEGWGEFHVNGGSVSIY  
5 VQR

SEQ ID No. 3

gccccgcacatacgaaaagactggctgaaaacattgagcctttgatgactgatgattggctgaagaagtggatcgattg  
tttgagaaaagaagaagaccataaaaataccttgctgtcatcagacagggtatttttatgctgtccagactgtccgct  
10 gtgtaaaaataaggaataaaggggggtgtatttttactgatatgtaaaatataattgtataagaaaatgagaggg agaggaaac  
atgattcaaaaacgaaagcggacagtttcgttcagacttggtgcttatgtgcacgctgttatttgcagttt  
gccgattacaaaacatcagccGTAAATGGCACGCTGATGCAGTATTTTGAATGGTATACGC  
C G A A C G A C G G C C A G C A T T  
15 GGAAACGATTGCAGAATGATGCGGAACATTTATCGGATATCGGAATCACTGCCG  
T C T G G A T T C C T C C C G C A T A C A A A G G A  
TTGAGCCAATCCGATAACGGATACGGAGCTTATGATTTGTATGATTTAGGAGAA  
T T C C A G C A A A A A G G G A C G G T C A G A A C  
GAAATACGGCACAAAATCAGAGCTTCAAGATCGGATCGGCTCACTGCATTCCCG  
20 G A A C G T C C A A G T A T A C G G A G A T G T G G  
TTTTGAATCATAAGGCTGGTGCTGATGCAACAGAAGATGTAAGTCCGTCGAAG  
T C A A T C C G G C C A A T A G A A A T C A G G A A  
ACTTCGGAGGAATATCAAATCAAAGCGTGGACGGATTTTCGTTTTCCGGGGCCGT  
G G A A A C A C G T A C A G T G A T T T T A A A T G  
GCATTGGTATCATTTCGACGGAGCGGACTGGGATGAATCCCGGAAGATCAGCCG  
25 C A T C T T T A A G T T T C G T G G G G A A G G A A  
AAGCGTGGGATTGGGAAGTATCAAGTGAAAACGGCAACTATGACTATTTAATGT  
A T G C T G A T G T T G A C T A C G A C C A C C C T  
GATGTCGTGGCAGAGACAAAAAATGGGGTATCTGGTATGCGAATGAACTGTCA  
T T A G A C G G C T T C C G T A T T G A T G C C G C  
30 CAAACATATTAAATTTTCATTTCTGCGTGATTGGGTTCAGGCGGTCAGACAGGC  
G A C G G G A A A A G A A A T G T T T A C G G T T G  
CGGAGTATTGGCAGAATAATGCCGGGAAACTCGAAAACACTTGAATAAAACA

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A G C T T T A A T C A A T C C G T G T T T G A T G T T  
CCGCTTCATTTCAATTTACAGGCGGCTTCCTCACAAGGAGGCGGATATGATATG  
A G G C G T T T G C T G G A C G G T A C C G T T G T  
GTCCAGGCATCCGGAAAAGGCGGTTACATTTGTTGAAAATCATGACACACAGCC  
5 G G G A C A G T C A T T G G A A T C G A C A G T C C  
AAACTTGGTTTAAACCGCTTGCATACGCCTTTATTTTGACAAGAGAATCCGGTTA  
T C C T C A G G T G T T C T A T G G G G A T A T G  
TACGGGACAAAAGGGACATCGCCAAAGGAAATCCCTCACTGAAAGATAATAT  
A G A G C C G A T T T T A A A A G C G C G T A A G G A  
10 GTACGCATACGGGCCCCAGCACGATTATATTGACCACCCGGATGTGATCGGATG  
G A C G A G G G A A G G T G A C A G C T C C G C C G  
CCAAATCAGGTTTGGCCGCTTTAATCACGGACGGACCCGGCGGATCAAAGCGGA  
T G T A T G C C G G C C T G A A A A A T G C C G G C  
GAGACATGGTATGACATAACGGGGCAACCGTTCAGATACTGTAAAAATCGGATCT  
15 G A C G G C T G G G G A G A G T T T C A T G T A A A  
CGATGGGTCCGTCTCCATTTATGTTTCAGAAATAA  
g g t a a t a a a a a c a c c t c c a a g c t g a g t g c g g g t a t c a g c t t g g a  
ggtgcgtttattttttcagccgtatgacaaggtcggcatcaggtgtgacaaatacggatgctggtgtcataggtgaca  
aatccgggttttgcgccgtttggcgttttcacatgtctgattttgtataatcaacaggcacggagccggaatctttcgc  
20 cttgaaaaataagcggcgatcgtagctgcttccaatatggattgttcacgggatcgctgcttttaatacacaacgtggg atcc

SEQ ID No. 4

VNGTLMQYFEWYTPNDGQHWKRLQND AEHLS DIGITAVWI  
PPAYKGLSQSDNGYGPYDLYDLGEFQQKGTVRTKYGTKSE  
25 LQDAIGSLHSRNVQVYGDVVLN HKAGADATEDVTAVEVNP  
ANRNQETSEEYQIKAWTDFRFPGRGNTYSDFKWHWYHFDG  
ADWDESRKISRIFKFRGEGKAWDWEVSSENGNYDYLMYAD  
VDYDHPDVVAETKKWGIWYANELSLDGFRIDA AKH IKFSF  
LRDWVQAVRQATGKEMFTVAEYWQNNAGKLENYLNKTSFN  
30 QSVFDVPLHFNLQAASSQGGGYDMRRLLDGTVVSRHPEKA  
VTFVENHDTQPGQSLESTVQTFWKPLAYAFILTRESGYRQ  
VFYGD MYG TKGTSPKEIPSLKDNIEPILKARKEYAYGPQH

DYIDHPDVIGWTREGDSSAAKSGLAALITDGPGGSKRMYA  
GLKNAGETWYDITGNRSDTVKIGSDGWGEFHVNDGSVSIY

SEQ ID No. 5

5 aaattcgatattgaaaacgattacaaataaaaattataatagacgtaaacgttcgaggggttgctcccttttactcttt  
ttatgcaatcgtttcccttaatttttgaagccaaaccgtcgaatgtaacatttgattaagggggaagggcatt  
gtgct aacgtttcaccgcattcgaaggaatggatgttcctgctcggttttgctcactgtctcgctgttctgcccacag  
gacagcccgcgaaggctGCCGCACCGTTTAACGGCACCATGATGCAGTATTTTGAATGGT  
10 A C T T G C C G G A T G A T G G C A C G  
TTATGGACCAAAGTGGCCAATGAAGCCAACAACCTTATCCAGCCTTGGCATCACC  
G C T C T T T G G C T G C C G C C C G C T T A C A A  
AGGAACAAGCCGCAGCGACGTAGGGTACGGAGTATACGACTTGTATGACCTCG  
G C G A A T T C A A T C A A A A A G G G A C C G T C C  
GCACAAAATACGGAACAAAAGCTCAATATCTTCAAGCCATTCAAGCCGCCACG  
15 C C G C T G G A A T G C A A G T G T A C G C C G A T  
GTCGTGTTTCGACCATAAAGGCGGCGCTGACGGCACGGAATGGGTGGACGCCGTC  
G A A G T C A A T C C G T C G A C C G C A A C C A  
AGAAATCTCGGGCACCTATCAAATCCAAGCATGGACGAAATTTGATTTTCCCGG  
G C G G G G C A A C A C C T A C T C C A G C T T T A  
20 AGTGGCGCTGGTACCATTTTACGGCGTTGATTGGGACGAAAGCCGAAAATTGA  
G C C G C A T T T A C A A A T T C C G C G G C A T C  
GGCAAAGCGTGGGATTGGGAAGTAGACACGGAAAACGGAAACTATGACTACTT  
A A T G T A T G C C G A C C T T G A T A T G G A T C A  
TCCCGAAGTCGTGACCGAGCTGAAAAACTGGGGGAAATGGTATGTCAACACAA  
25 C G A A C A T T G A T G G G T T C C G G C T T G A T G  
CCGTCAAGCATATTAAGTTCAGTTTTTTTCTGATTGGTTGTCGTATGTGCGTTC  
T C A G A C T G G C A A G C C G C T A T T T A C C  
GTCGGGGAATATTGGAGCTATGACATCAACAAGTTGCACAATTACATTACGAAA  
A C A G A C G G A A C G A T G T C T T T G T T T G A  
30 TGCCCCGTTACACAACAAATTTTATACCGCTTCCAAATCAGGGGGCGCATTGA  
T A T G C G C A C G T T A A T G A C C A A T A C T C  
TCATGAAAGATCAACCGACATTGGCCGTCACCTTCGTTGATAATCATGACACCG

A A C C C G G C C A A G C G C T G C A G T C A T G G  
 GTCGACCCATGGTTCAAACCGTTGGCTTACGCCTTTATTCTAACTCGGCAGGAA  
 G G A T A C C C G T G C G T C T T T T A T G G T G A  
 CTATTATGGCATTCCACAATATAACATTCCTTCGCTGAAAAGCAAATCGATCC  
 5 G C T C C T C A T C G C G C G C A G G G A T T A T G  
 CTTACGGAACGCAACATGATTATCTTGATCACTCCGACATCATCGGGTGGACAA  
 G G G A A G G G G G C A C T G A A A A A C C A G G A  
 TCCGGACTGGCCGCACTGATCACCGATGGGCCGGGAGGAAGCAAATGGATGTA  
 C G T T G G C A A A C A A C A C G C T G G A A A A G T  
 10 GTTCTATGACCTTACCGGCAACCGGAGTGACACCGTCACCATCAACAGTGATGG  
 A T G G G G G G A A T T C A A A G T C A A T G G C G  
 GTTCGGTTTCGGTTTGGGTTCTAGAAAAACGACCGTTTCTACCATCGCTCGGCC  
 G A T C A C A A C C C G A C C G T G G A C T G G T  
 GAATTCGTCCGTTGGACCGAACCACGGTTGGTGGCATGGCCTTGA

tgcctgcga

SEQ ID No. 6

AAPFNGTMMQYFEWYLPDDGTLWTKVANEANNLSSLGITA  
 LWLPAYKGTSRSDVGYGVYDLYDLGEFNQKGTVRTKYGT  
 20 KAQYLQAIQAAHAAGMQVYADVVDHKGADGTEWVDAVE  
 VNPSDRNQEISGTYQIQAWTKFDFPGRGNTYSSFKWRWYH  
 FDGVDWDESRKLSRIYKFRGIGKAWDWEVDTEGNYDYLM  
 YADLDMDHPEVVTELKNWGKWYVNTTNIDGFRLDAVKHIK  
 FSFFPDWLSYVRSQTGKPLFTVGEYWSYDINKLHNYITKT  
 25 DGTMSLFDAPLHNKFYTASKSGGAFDMRTLMTNTLMKDQP  
 TLAVTFVDNHDTEPGQALQSWVDPWFKPLAYAFILTRQEG  
 YPCVFYGDYYGIPQYNIPSLKSKIDPLLIARRDYAYGTQH  
 DYLDHSDIIGWTREGGTEKPGSGLAALITDGPGGSKWMYV  
 GKQHAGKVFYDLTGNRSDTVTINSBGWGEFKVNGGSVSVW  
 30 VPRKTTVSTIARPITTRPWTGEFVRWTEPRLVAW

